



# U.S. PATENT OFFICE

## PATENT SPECIFICATION

684,290

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### COMPLETE SPECIFICATION

#### Tampon Applicators

We, TAMPAX INCORPORATED, a corporation organised and existing under the laws of the State of Delaware, United States of America, of Palmer, Massachusetts, 5 United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the 10 following statement:—

The present invention relates to tampon applicators of the type wherein a tampon normally packed in one end portion of a tubular carrier is ejectable therefrom by 15 means of a tubular pusher extending through the opposite end of said carrier.

In known forms of tampon applicators difficulty has been met in producing a 20 device wherein the parts uniformly retain their initial assembled relation under widely varied conditions of handling. Thus, for example, unless the frictional contact between the carrier tube and the pusher or ejector is approximately optimum, the 25 engagement between them may become either too loose or too tight for most satisfactory service and operation.

One object of the present invention has been to provide an applicator construction 30 wherein satisfactory interengagement of the carrier and ejector tubes may be economically effected even in the case of tubes of such relative normal diameters as to produce when telescoped too loose a fit 35 either initially or afterward.

A further object has been to provide an 40 applicator construction wherein the carrier and ejector tubes are in readily releasable interlocking engagement and means are provided by which the carrier or outer tube may readily be held while the ejector or inner tube is pushed endwise therein to eject the tampon.

An applicator having the advantageous 45 features above noted is conveniently provided by a construction including an outer

or tampon carrying tube, an inner or ejector tube telescoped therewith, and a tampon packed in one end portion of the carrier tube in position to be ejected 50 therefrom by endwise movement of the inner or ejector tube a part of which extends into and telescopically engages the other end portion of said carrier tube; and overlapping portions of said outer and inner 55 tubes are releasably interlocked by a deformation of one which extends into and engages an opposed deformation of the other, the deformation of the outer tube being shaped and dimensioned to form a 60 finger abutment, whereby the outer tube can be held against slipping between the fingers when the ejector tube is pushed. Where the deformation of both tubes is effected while they are in telescoped 65 relation, the interlock is not and need not be disturbed until the inner tube is actuated to eject the tampon from the outer tube.

In this specification and the accompanying drawings we have shown and described 70 a preferred embodiment of our invention and suggested various modifications thereof; but it is to be understood that these are not intended to be exhaustive nor limiting of the invention but, on the 75 contrary, are given for purposes of illustration in order that others skilled in the art may fully understand the invention and the principles thereof and the manner of applying it in various forms, each as may 80 be best suited to the conditions of a particular use.

In order that the invention may be more clearly understood, reference will now be made to the accompanying drawing, in 85 which:—

Figure 1 is a side elevation of the preferred form of a complete applicator according to this invention with the inner and outer tubes telescoped and releasably 90 interlocked and a tampon in place in the outer tube;

[Price 2/8]

Price 25p

Figure 2, a central longitudinal section; Figure 3, a transverse section on the line 3-3 of Figure 2; and

Figure 4 is a fragmentary view similar to Figure 2 but of a modified form.

Referring to the drawings, a tampon 1 of any substance or material suitable for the intended use or purpose is mounted in one end portion of a hollow carrier, 10 such as a spirally wound paper tube 2, or the like. An inner or ejector tube 3, also of spirally wound paper, or the like, extends into the other end of outer tube 2 in easy sliding and telescoping engagement 15 therewith. When said tubes 2 and 3 are in the proper or desired relation portions of the walls of one thereof are releasably interlocked with opposed portions of the walls of the other by pressing said portions 20 inwardly to form an inwardly extending deformation or protuberance 4 in the inner tube and an inwardly extending deformation or protuberance 5 in the outer tube which interengages with said 25 deformation 4 in nesting relation thereto. The character of the material of the tubes and the shape and depth of the deformations are such that said tubes are effectively held 30 against accidental displacement from their initial assembled relation under all normal conditions of transportation or handling and until the inner tube 3 is pressed inwardly to eject tampon 1 from carrier tube 2.

35 The deformation 5, whether outwardly or inwardly directed, is of area adapted to receive the pad or ball of the finger when the applicator is used, so that it can be securely held against slipping between the fingers when the ejector tube is pushed in. The depth of the deformation is sufficient to give a substantial grip to the finger therein and is substantially greater than the maximum clearance to be expected 40 in the telescoped tubes, so that there is an actual and effective interlock between them. The depth is advantageously within the limit of elastic stretch of the paper tube, but that is not essential. This depth 45 is advantageously achieved abruptly on the exterior at least at the lower border 6 to give more effective finger grip while on the inner (ejector) tube 3 the deformation is more gradual i.e. less steep, so that an 50 axial force on the ejector tube will have better mechanical advantage to stretch the outer (carrier) tube and release the interlock.

55 The shape of these deformations as viewed in plan is not essential to the invention. Given the area as set forth above and the abrupt shoulder 6 as described, the deformation may be uniformly sloped down from the upper edge 7 to the bottom 60 or it may be uniformly depressed through-

out. It may be round in plan or it may be more or less squared or elliptical or oval. The abrupt shoulder 6 may be in relief instead of impressed, i.e. it may extend upward from the cylindrical surface 70 to which the tube approximates instead of extending below it as shown; and in such case the deformation is an outward projection instead of an inward depression. The upper edge of this projection may be somewhat crescent shaped to fit the finger tips in a manner and for the purpose described in connection with Figures 1 to 3.

75 The deformations 4 and 5 are conveniently formed in tubes 3 and 2 by appropriately shaped movable dies (not shown) while said tubes are enclosed peripherally by a snugly fitting die support provided with openings through which to move the deforming dies. Advantageously, with the embodiment shown and described above, dies are used only on the exterior and thus the deformation is abrupt on the exterior and less so on the interior. These deforming dies are advantageously heated so as to 80 temporarily soften the adhesive in the laminated tube at the deformed area and to give the fiber a permanent set.

85 Figure 4 shows another embodiment of the invention in which the abutment is made by deforming the tube outward instead of inward.

90 What we claim is:—

1. A tampon applicator comprising an outer tampon carrier tube, a tampon 100 mounted in the forward end portion thereof, and an inner ejector tube having one end portion slidably engaged and releasably interlocked with the rearward end portion of said outer tube, a portion of the 105 wall of said inner tube being deformed inwardly to provide a recess in its periphery and a portion of the wall of said outer tube being deformed inwardly to provide a 110 protuberance positioned to engage said inner tube recess and to provide an exteriorly exposed recess having an end wall which forms a transversely extending shoulder affording a finger hold for said outer tube.

115 2. A tampon applicator comprising an outer tampon carrier tube, a tampon mounted in the forward end portion thereof, and an inner ejector tube having one end portion telescoped into the 120 rearward end portion of said outer tube, a portion of the wall of said outer tube being deformed to provide a finger abutment in the form of an abrupt transversely extending shoulder on its periphery, and a portion 125 of the wall of said inner tube being deformed in the same direction in the corresponding area to provide interengaging protuberance and recess releasably interlocking said tubes together.

3. A tampon applicator comprising an outer tampon carrier tube, a tampon mounted in the forward end portion thereof, and an inner ejector tube having one end portion telescoped into the rearward end portion of said outer tube, a portion of the wall of said outer tube being deformed to provide an inwardly or outwardly extending protuberance having its inner and outer surfaces continuous with the inner and outer surfaces, respectively, of said carrier tube and to provide on the periphery of the carrier tube a finger abutment and a portion of the wall of said inner tube being deformed in the same direction in the corresponding area to inter-engage with said protuberance and releasably interlock said tubes together.

4. A tampon applicator as defined in claim 2 or 3, in which the finger abutment 20 is an abrupt border of a depression of finger tip area.

5. A tampon applicator constructed substantially as described with reference to Figs. 1 to 3 of the accompanying drawing.

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1 SHEET. This drawing is a reproduction of  
the Original on a reduced scale.

Fig. 1.

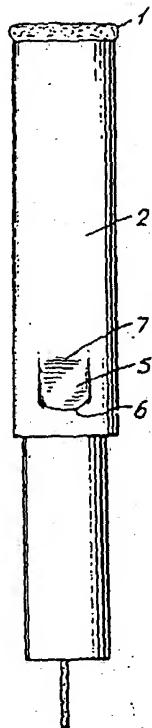


Fig. 2.

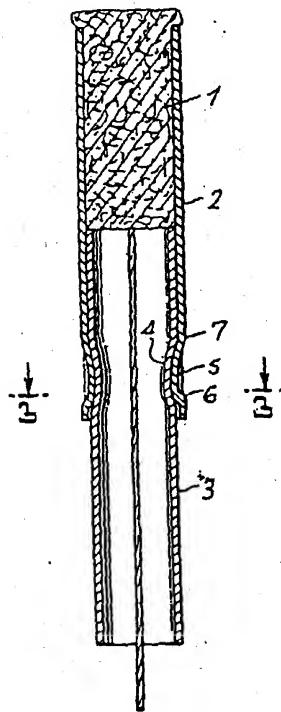


Fig. 3.

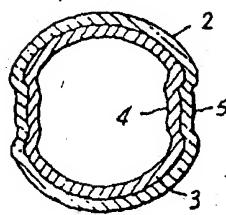


Fig. 4.

